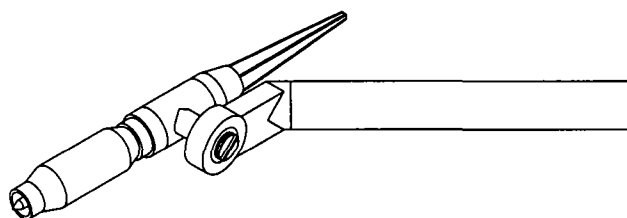




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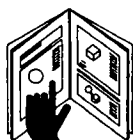
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OWNER'S MANUAL



MTL-20 Torches

- Water-Cooled Torches For GTAW Welding
- Rated At 250 Amperes 100% Duty Cycle Using Argon Shielding Gas
- .020 Thru 5/32 in (0.5 Thru 4.0 mm) Tungsten Size Capacity
- Includes 12-1/2 Or 25 ft (3.8 Or 7.6 m) Cable
- Remote Contactor And Current Control Available
- Tungsten Electrode And Some Torch Parts Needed



- Read and follow these instructions and all safety blocks carefully.
- Have only trained and qualified persons install, operate, or service this unit.
- Call your distributor if you do not understand the directions.



- Give this manual to the operator.



- For help, call your distributor
- or: MILLER Electric Mfg. Co., P.O. Box 1079, Appleton, WI 54912 414-734-9821

MILLER'S TRUE BLUE™ LIMITED WARRANTY

Effective January 1, 1992
(Equipment with a serial number preface of "KC" or newer)

This limited warranty supersedes all previous MILLER warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY — Subject to the terms and conditions below, MILLER Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new MILLER equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by MILLER. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, MILLER will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. MILLER must be notified in writing within thirty (30) days of such defect or failure, at which time MILLER will provide instructions on the warranty claim procedures to be followed.

MILLER shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to the distributor.

- 1 5 Years Parts — 3 Years Labor
 - Original main power rectifiers
- 2 3 Years — Parts and Labor
 - Transformer/Rectifier Power Sources
 - Plasma Arc Cutting Power Sources
 - Semi-Automatic and Automatic Wire Feeders
 - Robots
- 3 2 Years — Parts and Labor
 - Engine Driven Welding Generators
(NOTE: Engines are warranted separately by the engine manufacturer for a period of two years.)
 - Air Compressors
- 4 1 Year — Parts and Labor
 - Motor Driven Guns
 - Process Controllers
 - Water Coolant Systems
 - HF Units
 - Grids
 - Spot Welders
 - Load Banks
 - SDX Transformers
 - Running Gear/Trailers
 - Field Options

(NOTE: Field options are covered under True Blue™ for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
- 5 6 Months — Batteries
- 6 90 Days — Parts and Labor
 - MIG Guns/TIG Torches
 - Plasma Cutting Torches

- Remote Controls
- Accessory Kits
- Replacement Parts

MILLER'S True Blue™ Limited Warranty shall not apply to:

- 1 Items furnished by MILLER, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
- 2 Consumable components, such as contact tips, cutting nozzles, contactors and relays or parts that fail due to normal wear.
- 3 Equipment that has been modified by any party other than MILLER, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at MILLER'S option: (1) repair, or (2) replacement, or, where authorized in writing by MILLER in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized MILLER service station, or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. MILLER'S option of repair or replacement will be F O B Factory at Appleton, Wisconsin, or F O B at a MILLER authorized service facility as determined by MILLER. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT, TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

RECEIVING-HANDLING

Before unpacking equipment, check carton for any damage that may have occurred during shipment. File any claims for loss or damage with the delivering carrier. Assistance for filing or settling claims may be obtained from distributor and/or equipment manufacturer's Transportation Department.

When requesting information about this equipment, always provide Model Designation and Serial or Style Number.

Use the following spaces to record Model Designation and Serial or Style Number of your unit. The information is located on the rating label or nameplate.

Model _____

Serial or Style No. _____

Date of Purchase _____

SAFETY PRECAUTIONS FOR GTAW TORCHES



WARNING

GTAW WELDING can be hazardous.

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR.

In welding, as in most jobs, exposure to certain hazards occurs. Welding is safe when precautions are taken. The safety information given below is only a summary of the more complete safety information found in the welding power source Owner's Manual. Read and follow all safety precautions.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

	ELECTRIC SHOCK can kill. <ol style="list-style-type: none"> 1. Always wear dry insulating gloves. 2. Insulate yourself from work and ground. 3. Do not touch live electrode or electrical parts. 4. Repair or replace worn, damaged, or cracked torch or cable insulation. 5. Turn off welding power source before changing tungsten electrode or torch parts. 6. Keep all covers and handle securely in place. 		WELDING can cause fire or explosion. <ol style="list-style-type: none"> 1. Do not weld near flammable material. 2. Do not weld on closed containers. 3. Watch for fire; keep extinguisher nearby.
	ARC RAYS can burn eyes and skin. <ol style="list-style-type: none"> 1. Wear welding helmet with correct shade of filter. 2. Wear correct eye and body protection. 3. Cover exposed skin. 		HOT SURFACES can burn skin. <ol style="list-style-type: none"> 1. Allow torch to cool before touching. 2. Do not touch hot metal. 3. Protect hot metal from contact by others.
	FUMES AND GASES can be hazardous to your health. <ol style="list-style-type: none"> 1. Keep your head out of the fumes. 2. Ventilate area, or use breathing device. 3. Read Material Safety Data Sheets (MSDSs) and manufacturer's instructions for material used. 		NOISE can damage hearing; SOME APPLICATIONS, SUCH AS PULSING, are noisy. <ol style="list-style-type: none"> 1. Check for noise level limits exceeding those specified by OSHA. 2. Use approved ear plugs or ear muffs if noise level is high. 3. Warn others nearby about noise hazard.

EMF INFORMATION

NOTE

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, *Biological Effects of Power Frequency Electric & Magnetic Fields – Background Paper*, OTA-BP-E-53 (Washington, DC: U.S. Government Printing Office, May 1989): "... there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields can interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around the body.
4. Keep welding power source and cables as far away as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

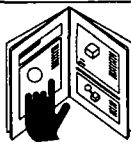
About Pacemakers:

The above procedures are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

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SECTION 1 – SAFETY INFORMATION

mod1.1 2/93



- Read all safety messages throughout this manual.
- Obey all safety messages to avoid injury.
- Learn the meaning of WARNING and CAUTION.

1 **2** **WARNING**

3 **ELECTRIC SHOCK can kill.**

4

- Do not touch live electrical parts.
- Disconnect input power before installing or servicing.

5

2 **CAUTION**

MOVING PARTS can injure.

- Keep away from moving parts.
- Keep all panels and covers closed when operating.

6 **WARNING** **READ SAFETY BLOCKS at start of Section 3-1 before proceeding.**

7 **NOTE** *Turn Off switch when using high frequency.*

1 Safety Alert Symbol

2 Signal Word

WARNING means possible death or serious injury can happen.

CAUTION means possible minor injury or equipment damage can happen.

3 Statement Of Hazard And Result

4 Safety Instructions To Avoid Hazard

5 Hazard Symbol (If Available)

6 Safety Banner

Read safety blocks for each symbol shown.

7 NOTE

Special instructions for best operation – not related to safety.

Figure 1-1. Safety Information

SECTION 2 – SPECIFICATIONS

Table 2-1. Welding Torch

Specification	Description	
Model Description	MT: Miller Torch; L: Flex Lok; 20: 250 Ampere Rating; 12: 12-1/2 ft (3.8 m) Cable; 25: 25 ft (7.6 m) Cable Example: MTL-20-12 – Miller Torch; Flex Lok; 250 Ampere Rating; 12-1/2 ft (3.8 m) Cable	
Ampere Rating At 100% Duty Cycle DCEN, ACHF	250 Amperes Using Argon Gas	
Cooling Method	Water Cooling	
Coolant Flow Rate	1 qt/min (0.94 L/min)	
Tungsten Size Capacity	.020 Thru 5/32 in (0.5 Thru 4.0 mm)	
Torch Body Dimensions And Weight	Length: 9-1/2 in (241 mm); Handle Diameter: 3/4 in (19 mm); Weight: 5 oz (140 g)	
Options And Accessories	See Rear Cover	
	12-1/2 ft (3.8 m) Cable	25 ft (7.6 m) Cable
Total Weight	Net: 2 lb (0.9 kg); Ship: 2 lb (0.9 kg)	Net: 3 lb (1.4 kg); Ship: 3 lb (1.4 kg)

2-1. Duty Cycle




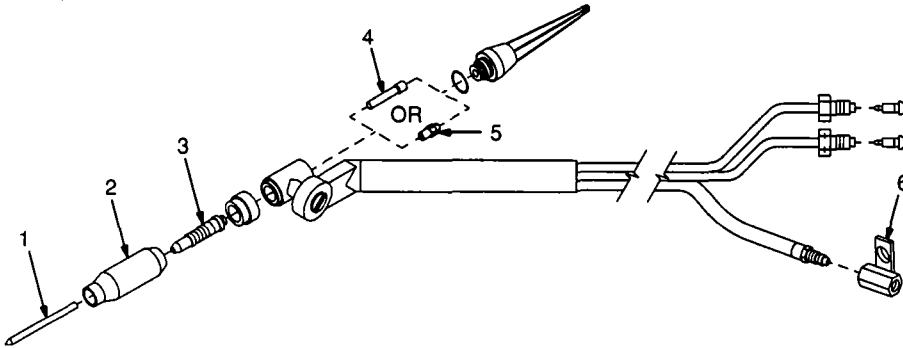
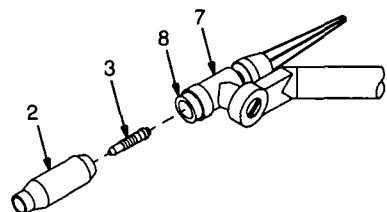
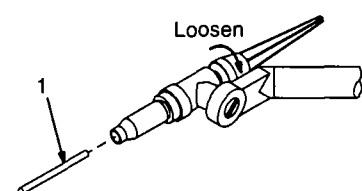
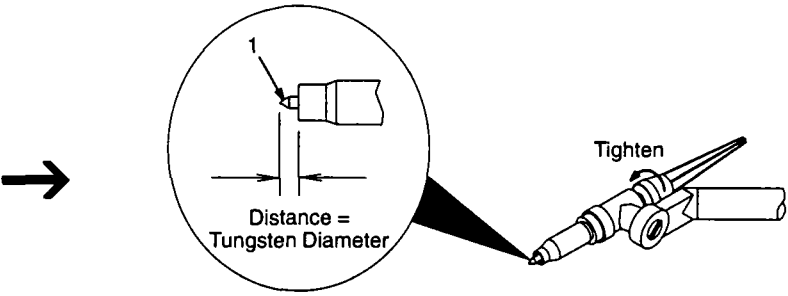
CAUTION	
WELDING LONGER THAN RATED DUTY CYCLE can damage torch and void warranty.	
• Do not weld at rated load longer than shown below.	
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 <p>Minutes</p>	<p>Definition</p> <p>Duty Cycle is percentage of 10 minutes that torch can weld at rated load without overheating.</p>
<p>100% Duty Cycle At 250 Amperes Using Argon Gas</p> <div></div> <p>Continuous Welding</p>	
sb1.5* 8/93	

Figure 2-1. Duty Cycle

SECTION 3 – INSTALLATION & OPERATION

3-1. Required Torch Parts And Torch Assembly

<p>Required Torch Parts</p> 	<p>Obtain the following parts (see Section 6):</p> <ol style="list-style-type: none">1 Tungsten Electrode (See Section 5)2 Cup3 Collet Body4 Standard Collet5 Reverse Collet <p>Reverse collet improves electrical contact of tungsten electrode.</p> 6 Power Cable Adapter
<p>Assembling Torch Parts</p> 	<p>Assembling Torch Body</p> <ol style="list-style-type: none">7 Flex-Lok Head8 Heat Shield9 Backcap (Long Backcap Shown)
<p>Installing Tungsten</p> 	<p>Installing Tungsten</p> <p>To adjust tungsten position, loosen backcap.</p> <p>Keep connections tight. Replace cup, heat shield, backcap, and O-rings if cracked.</p>
	

Ref. ST-800 454

Figure 3-1. Required Torch Parts And Torch Assembly

3-2. Adjusting Flex-Lok Head



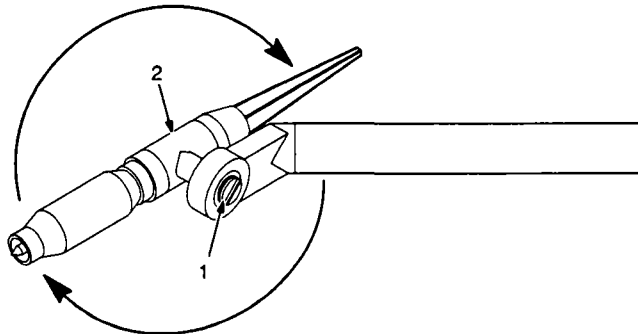
CAUTION

TOOLS can damage torch.

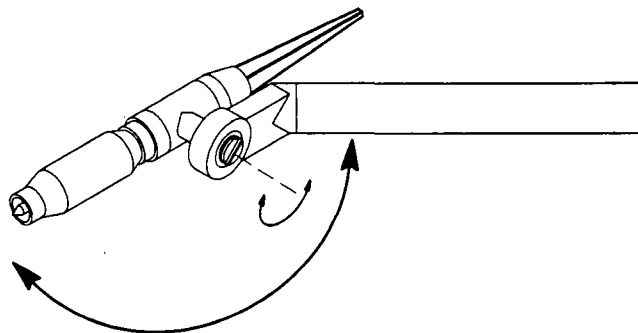
- Do not use hand tools to adjust torch flex-lok head.

1 Stem

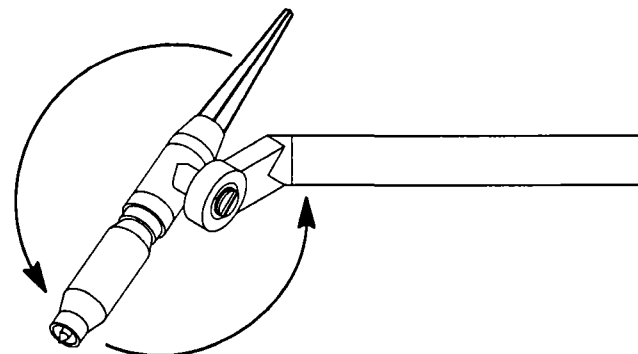
2 Head



Hold stem and turn head one full turn.



Turn head and stem to desired angle.



Hold stem and turn head until tight.

Ref. ST-141 477-B

Figure 3-2. Adjusting Flex-Lok Head

3-3. Connecting Torch

WARNING		READ SAFETY BLOCKS at beginning of manual before proceeding.
----------------	--	---

BUILDUP OF SHIELDING GAS can harm health or kill.

- Shut off shielding gas supply when not in use.

warn1.1 9/91

If applicable, install high-frequency unit.

Turn Off welding power source, and disconnect input power before installing torch.

Obtain the following hoses:

- Gas Hose With 5/8-18 Right-Hand Fittings
- Coolant Hose With 5/8-18 Left-Hand Fitting

Connections:

- Regulator/Flowmeter
- Gas Cylinder
- Welding Power Source
- Gas-In Hose
- Gas Valve

Valve controls gas preflow and postflow. Preflow aids arc starting. Preflow and postflow prevent electrode from forming a black surface (oxidizing).

After welding, allow 10 seconds of gas postflow for every 100 amperes of weld current.

- Coolant-In Hose
- Power Cable/Coolant-Out Hose
- Power Cable Adapter

Connect hoses to adapter before connecting adapter to weld output terminal.

11 Cooling System

Mix coolant according to cooling system owner's manual.

Torch is rated at 1 qt/min (0.94L/min) coolant flow rate. Maintain proper flow rate at all times.

- Input Power Plug
- Grounded AC Receptacle

Connect plug to proper receptacle.

- Work Clamp

Connect work clamp to a clean, paint-free location on workpiece, as close to weld area as possible.

Use wire brush or sandpaper to clean metal at weld joint area.

Tools Needed:

5/8, 7/8 in

Ref. ST-800 454

Figure 3-3. Connecting Torch

3-4. Coolant Guidelines

WARNING		
	<p>ELECTRIC SHOCK can kill; MOVING PARTS can cause serious injury.</p> <ul style="list-style-type: none"> Do not touch live electrical parts. Keep away from moving parts. Disconnect input power plug from receptacle before cleaning system components. 	<p>INCORRECT COOLANT will damage torch and cooling system.</p> <ul style="list-style-type: none"> Use plain distilled or deionized water, or use high quality tap water. In freezing temperatures use only a mix of pure ethylene glycol and distilled or deionized water such as MILLER coolant Part No. 128 705 or equivalent. DO NOT USE AUTOMOTIVE ANTIFREEZE.
	<p>FAILURE TO PROPERLY MAINTAIN COOLANT SYSTEM can cause damage to the coolant system and torch/gun.</p> <ul style="list-style-type: none"> Circulate and flush clear water through entire system, and replace coolant every six months. 	

 TEMP.	Above 32° F (0° C)	0° F (-18° C) to 32° F (0° C)	Below 0° F (-18° C)
<div style="display: flex; align-items: center; justify-content: center;"> 1 </div> <p style="margin-top: 5px;">Coolant</p>	Distilled, Deionized, Or High Quality Tap Water	35% Ethylene Glycol And 65% Water	See Ethylene Glycol Manufacturer's Suggestion

Draining

Filling

Tighten Connections

3
4

Follow these guidelines to decrease corrosion in torch and cooling system.

Material in contact with coolant can only be brass, copper, silver solder, 300 Series stainless steel, or plastic.

1 Coolant

See table for coolant mixture needed for operating temperature.

2 Coolant System Tank

Keep coolant level full. Length of coolant hoses affects amount of coolant needed in unit.

3 Changing Coolant

Change coolant when dirty or every 6 months.

4 Connections

Keep connections tight. Make electrical connections with connectors of the same metal.

S-0760

Figure 3-4. Coolant Guidelines

SECTION 4 – MAINTENANCE & TROUBLESHOOTING

⚠ WARNING



READ SAFETY BLOCKS at beginning of manual before proceeding.

⚠ Turn Off all power before maintaining.

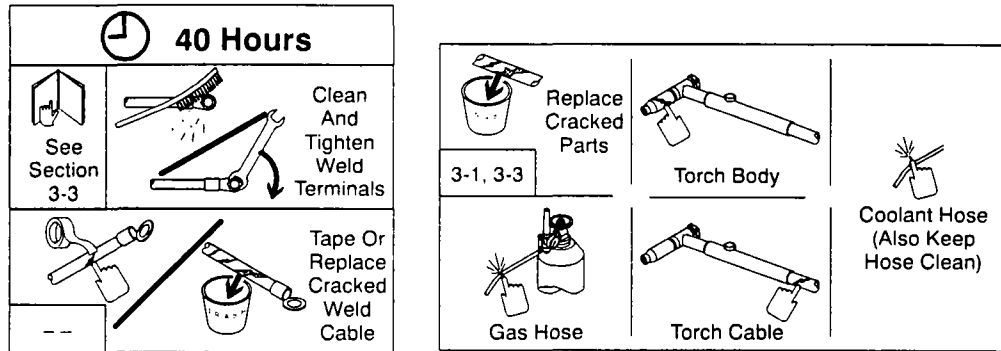


Figure 4-1. Maintenance Schedule

Table 4-1. Troubleshooting

NOTE

Before using troubleshooting table, check selection and preparation of tungsten electrode according to Section 5.

Trouble

Remedy

Lack of high frequency; difficulty in establishing arc.

Check cables and torch for cracks or bad connections. Be sure that torch cables are not close to any grounded metal. Repair or replace necessary parts.

Check welding power source high frequency control, and if necessary, check and adjust spark gaps.

Wandering arc – poor control of direction of arc.

Reduce gas flow rate according to welding power source Owner's Manual.

Tungsten electrode oxidizing and not remaining bright after conclusion of weld.

Shield weld zone from drafts. Check and tighten all gas fittings.

Increase postflow time according to welding power source Owner's Manual.

Check gas valve.

Torch and/or power cable/coolant-out hose overheats.

Check cooling system operation. Make sure coolant hoses are clear of obstructions and are not pinched.

SECTION 5 – TUNGSTEN ELECTRODE

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NOTE

For additional information, see your distributor for a handbook on the Gas Tungsten Arc Welding (GTAW) process.

Wear clean gloves to prevent contamination of tungsten electrode.

5-1. Selecting Tungsten Electrode

Table 5-1. Tungsten Size

Electrode Diameter	Amperage Range - Gas Type ♦ - Polarity			
	DC – Argon – Electrode Negative/Straight Polarity	DC – Argon – Electrode Positive/Reverse Polarity	AC – Argon – Using High Frequency	AC – Argon – Balanced Wave Using High Freq.
Pure Tungsten (Green Band)				
.010"	Up to 15	*	Up to 15	Up to 10
.020"	5-20	*	5-20	10-20
.040"	15-80	*	10-60	20-30
1/16"	70-150	10-20	50-100	30-80
3/32"	125-225	15-30	100-160	60-130
1/8"	225-360	25-40	150-210	100-180
5/32"	360-450	40-55	200-275	160-240
3/16"	450-720	55-80	250-350	190-300
1/4"	720-950	80-125	325-450	250-400
2% Thorium Alloyed Tungsten (Red Band)				
.010"	Up to 25	*	Up to 20	Up to 15
.020"	15-40	*	15-35	5-20
.040"	25-85	*	20-80	20-60
1/16"	50-160	10-20	50-150	60-120
3/32"	135-235	15-30	130-250	100-180
1/8"	250-400	25-40	225-360	160-250
5/32"	400-500	40-55	300-450	200-320
3/16"	500-750	55-80	400-500	290-390
1/4"	750-1000	80-125	600-800	340-525
Zirconium Alloyed Tungsten (Brown Band)				
.010"	*	*	Up to 20	Up to 15
.020"	*	*	15-35	5-20
.040"	*	*	20-80	20-60
1/16"	*	*	50-150	60-120
3/32"	*	*	130-250	100-180
1/8"	*	*	225-360	160-250
5/32"	*	*	300-450	200-320
3/16"	*	*	400-550	290-390
1/4"	*	*	600-800	340-525

♦ Typical argon shielding gas flow rates are 15 to 35 cfh (cubic feet per hour).

*Not Recommended.

The figures listed are intended as a guide and are a composite of recommendations from American Welding Society (AWS) and electrode manufacturers.

S-0009

5-2. Preparing Tungsten

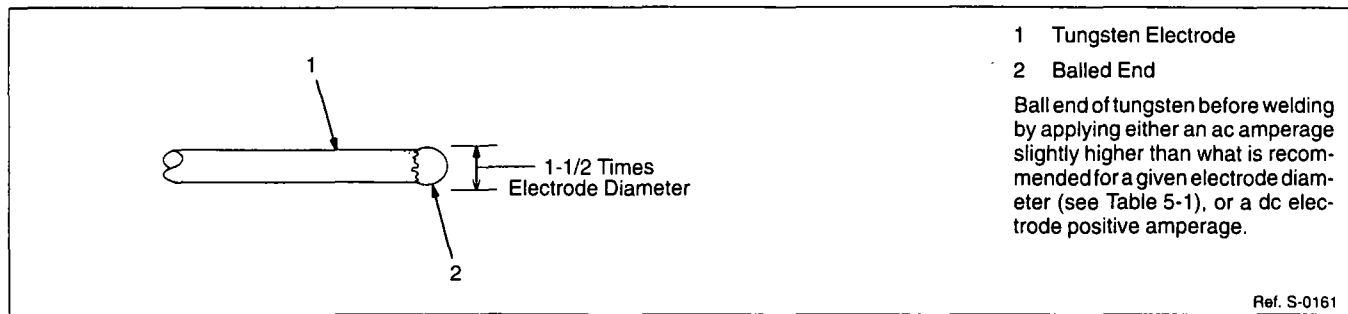


Figure 5-1. Preparing Tungsten For AC Or DC Electrode Positive (DCEP) Welding

CAUTION

FLYING SPARKS AND HOT METAL can cause injury and start fires.

- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Keep flammables away.

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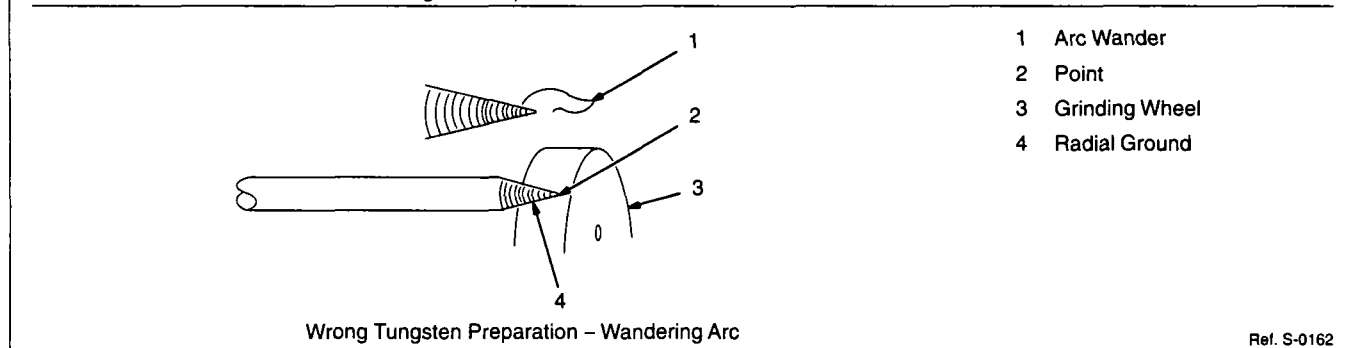
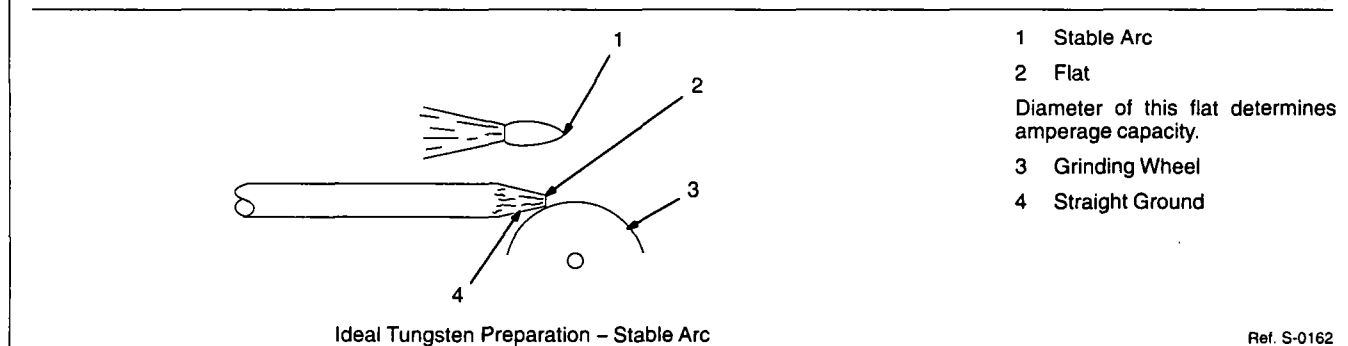
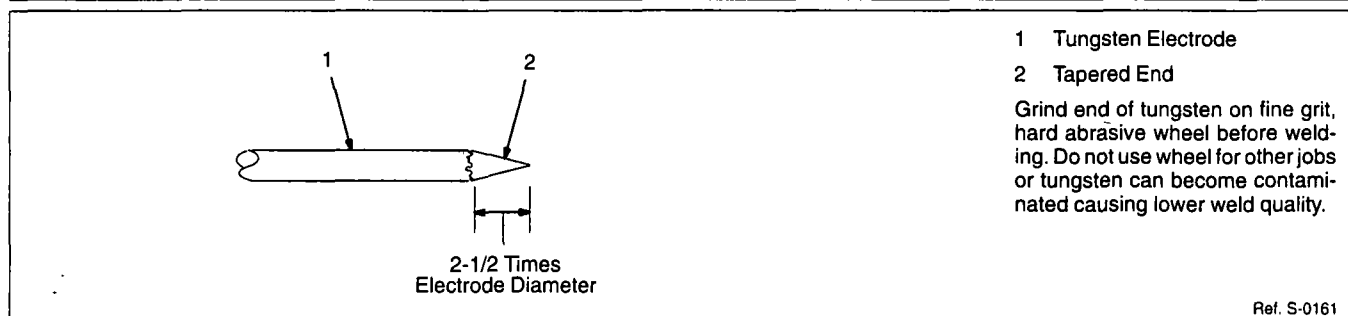
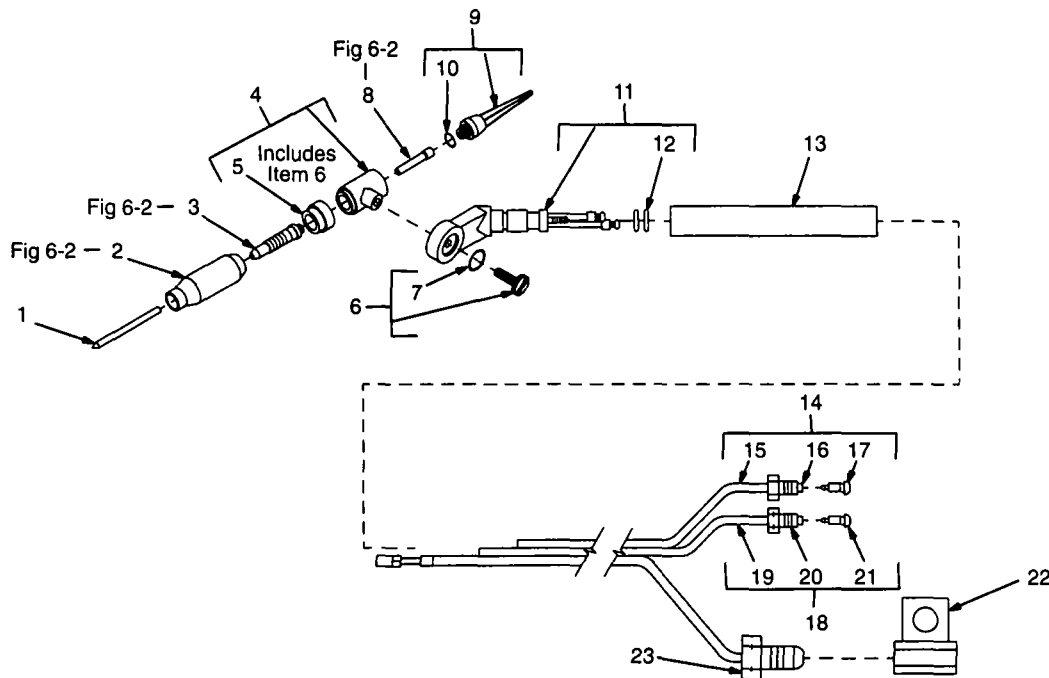


Figure 5-2. Preparing Tungsten For DC Electrode Negative (DCEN) Welding

SECTION 6 – PARTS LIST



SB-141 475

Figure 6-1. Complete Torch Assembly

Item No.	Stock No.	Model No.	Description	Quantity
Figure 6-1. Complete Torch Assembly				
1			TUNGSTEN, electrode (consult your welding supply distributor)	
2			CUP, (see Figure 6-2)	
3			COLLET BODY, (see Figure 6-2)	
4	118 526	FL3L	3 SERIES HEAD, (consisting of)	1
5	116 256	300HS	HEAT SHIELD, std	1
6	116 203	01-0009	HEAD ADJUSTMENT STEM (consisting of)	1
7	116 260	300R	O-RING	1
5	◆ 119 914	3GHS	HEAT SHIELD, small dia gas lens	1
5	◆ 119 915	3GHSLD	HEAT SHIELD, large dia gas lens	1
8			COLLET, (see Figure 6-2)	
9	116 257	300L	BACKCAP, long (consisting of)	1
9	◆ 116 258	300M	BACKCAP, medium (consisting of)	1
10	116 260	300R	O-RING	1
11	116 204	FLWB	FLEX LOC TORCH BODY, (consisting of)	1
12	116 217	01-0002	O-RING	2
13	117 585		HANDLE	1
14	116 267	212AH	GAS HOSE, 12-1/2 ft (consisting of)	1
14	116 268	225AH	GAS HOSE, 25ft (consisting of)	1
15	116 512		HOSE, black 1/8 ID (order by ft)	As Req'd
16	116 266	2AN	GAS NUT	1
17	116 269	3HF	HOSE FITTING	1
18	116 232	212WH	WATER HOSE, 12-1/2ft (consisting of)	1
18	116 233	225WH	WATER HOSE, 25ft (consisting of)	1
19	118 512		HOSE, black 1/8 ID (order by ft)	As Req'd
20	116 236	2WN	WATER NUT	1
21	116 269	3HF	HOSE FITTING	1
22	◆ 116 228	2PCA	POWER CABLE ADAPTER	1
23	116 231	212PC	POWER CABLE, 12-1/2ft	1
23	116 230	225PC	POWER CABLE, 25ft	1

◆OPTIONAL

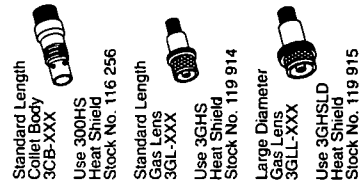
BE SURE TO PROVIDE MODEL AND STYLE NUMBER WHEN ORDERING REPLACEMENT PARTS.

CONSUMABLE PARTS SELECTOR

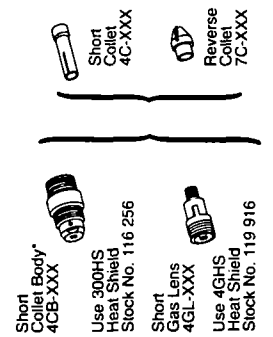
(Note: Collet, Collet Body and Gas Cup required to complete torch. Torches with high flex composite cable and water cooled torches also require a power cable adapter.)

Tungsten Diameter	in. (mm)	.020" (0.5)	.040" (1.0)	1/16" (1.6)	3/32" (2.4)	1/8" (3.2)	5/32" (4.0)
Amperage Range	ACHF DCSP	5-20 5-20	10-80 15-80	50-150 70-150	100-235 150-250	150-325 (220-350)	200-425 375-500
Collet (Standard)	Model No. Stock No.	3C20 116 367	3C40 116 368	3C116 116 369	3C332 116 370	3C418 116 371	3C532 116 372
Collet (Reverse)	Model No. Stock No.	7C20 116 379	7C40 116 380	7C116 116 381	7C332 116 382	7C418 116 383	7C532 116 384
Collet Body (Std. Lgh.)	Model No. Stock No.	3CB20 116 361	3CB40 116 362	3CB116 116 363	3CB332 116 364	3CB418 116 365	3CB532 116 366
Stock/Model No.							
Cup, Ceramic 1-27/32" Long	116 347 (3C3)						
	116 348 (3C4)						
	116 349 (3C5)						
	116 350 (3C6)						
	116 351 (3C7)						
Cup, Ceramic 3-7/32" Long	116 352 (3C8)						
	116 353 (3C10)						
	116 354 (3C12)						
	116 343 (3C4L)						
	116 344 (3C5L)						
Cup, Alumina 1-27/32" Long	116 345 (3C6L)						
	116 346 (3C7L)						
	116 330 (3A4)						
	116 331 (3A5)						
	116 332 (3A6)						
Gas Lens Collet Body Std. Lgh.	116 333 (3A7)						
	116 334 (3A8)						
	116 335 (3A10)						
	116 336 (3A12)						
	Model No. Stock No.	3GL20 119 926	3GL40 119 927	3GL116 119 928	3GL332 119 929	3GL418 119 930	3GL532 119 931
Stock/Model No.							
Cup, Ceramic Gas Lens 1-3/8" Long	119 917 (3CG4)						
	119 918 (3CG5)						
	119 919 (3CG6)						
	119 920 (3CG7)						
	119 921 (3CG8)						
Cup, Alumina 3CG11 is 1-1/8" Long	119 922 (3CG11)						
	119 923 (3CG12)						
	119 924 (3CG14)						
	119 925 (3CG16)						
	119 926 (3AG4)						
Cup, Alumina Gas Lens 1-5/8" Long	119 933 (3AG5)						
	119 934 (3AG6)						
	119 935 (3AG7)						
	119 936 (3AG8)						
	119 937 (3AG11)						
Stock/Model No.							
Gas Lens Collet Body Lg. Dia.	Model No. Stock No.						
Cup, Alumina 1-7/8" Long	119 911 (3AG10LD)						
	119 912 (3AG10LD)						
	119 913 (3AG12LD)						

STANDARD LENGTH FRONT ENDS



SHORT FRONT ENDS



*Reduce Continuous Duty Rating By 25% When Using Short Collet/Collet Body

Tungsten Diameter	in. (mm)	.020" (0.5)	.040" (1.0)	1/16" (1.6)	3/32" (2.4)	1/8" (3.2)	5/32" (4.0)
Amperage Range	ACHF DCSP	5-20 5-20	10-80 15-80	50-150 70-150	100-235 150-250	150-325 (220-350)	200-425 375-500
Collet (Short)	Model No. Stock No.	4C20 116 373	4C40 116 374	4C116 116 375	4C332 116 376	4C418 116 377	4C532 116 378
Collet (Reverse)	Model No. Stock No.	7C20 116 379	7C40 116 380	7C116 116 381	7C332 116 382	7C418 116 383	7C532 116 384
Collet Body (Short)	Model No. Stock No.	4CB20 116 355	4CB40 116 356	4CB116 116 357	4CB332 116 358	4CB418 116 359	4CB532 116 360
Stock/Model No.							
Cup, Ceramic 1-5/32" Long	116 337 (2C4)						
	116 338 (2C5)						
	116 339 (2C6)						
	116 340 (2C7)						
	*116 341 (2C8)						
Cup, Ceramic 1-7/8" Long	*116 342 (2C10)						
	116 326 (2C3L)						
	116 327 (2C4L)						
	116 328 (2C5L)						
	116 329 (2C6L)						
Cup, Alumina 1-5/32" Long	116 310 (2A4)						
	116 311 (2A5)						
	116 312 (2A6)						
	116 313 (2A7)						
	116 314 (2A8)						
Stock/Model No.							
Gas Lens Collet Body - Short	Model No. Stock No.	4GL20 119 905	4GL40 119 906	4GL116 119 907	4GL332 119 908	4GL418 119 909	4GL532 119 910
Stock/Model No.							
Cup, Alumina 1" Long	119 893 (2AG4)						
	119 894 (2AG5)						
	119 895 (2AG6)						
Stock/Model No.							
Cup, Alumina 1-1/8" Long	119 896 (2AG7)						

SHADED AREAS INDICATE RECOMMENDED USAGE

Figure 6-2. Consumable Parts

Table 6-1. Cross Reference To Competitive Model

STOCK NO.	MODEL NO.	COMPETITIVE NO.	STOCK NO.	MODEL NO.	COMPETITIVE NO.
116 367	3C20	10N21	119 925	3CG16	N/A
116 368	3C40	10N22	119 932	3AG4	54N18
116 369	3C116	10N23	119 933	3AG5	54N17
116 370	3C332	10N24	119 934	3AG6	54N16
116 371	3C418	10N25	119 935	3AG7	54N15
116 372	3C532	54N20	119 936	3AG8	54N14
116 379	7C20	N/A	119 937	3AG11	54N19
116 380	7C40	N/A	119 902	3GLL332	45V64
116 381	7C116	N/A	119 903	3GLL418	995795
116 382	7C332	N/A	119 904	3GLL532	45V63
116 383	7C418	N/A	119 911	3AG8LD	57N74
116 384	7C532	N/A	119 912	3AG10LD	53N88
116 361	3CB20	10N29	119 913	3AG12LD	53N87
116 362	3CB40	10N30	116 373	4C20	N/A
116 363	3CB116	10N31	116 374	4C40	10N22S
116 364	3CB332	10N32	116 375	4C116	10N23S
116 365	3CB418	10N28	116 376	4C332	10N24S
116 366	3CB532	406488	116 377	4C418	10N25S
116 347	3C3	N/A	116 378	4C532	N/A
116 348	3C4	105Z43	116 355	4CB20	N/A
116 349	3C5	105Z42	116 356	4CB40	17CB20
116 350	3C6	105Z44	116 357	4CB116	17CB20
116 351	3C7	105Z45	116 358	4CB332	17CB20
116 352	3C8	08N78	116 359	4CB418	17CB20
116 353	3C10	08N79	116 360	4CB532	N/A
116 354	3C12	08N80	116 337	2C4	13N14
116 343	3C4L	12N03	116 338	2C5	13N15
116 344	3C5L	105Z60	116 339	2C6	13N16
116 345	3C6L	12N02	116 340	2C7	13N17
116 346	3C7L	105Z61	116 341	2C8	13N18
116 330	3A4	10N50	116 342	2C10	13N19
116 331	3A5	10N49	116 326	2C3L	796F70
116 332	3A6	10N48	116 327	2C4L	796F71
116 333	3A7	10N47	116 328	2C5L	796F72
116 334	3A8	10N46	116 329	2C6L	796F73
116 335	3A10	10N45	116 310	2A4	13N08
116 336	3A12	10N44	116 311	2A5	13N09
119 926	3GL20	45V29	116 312	2A6	13N10
119 927	3GL40	45V24	116 313	2A7	13N11
119 928	3GL116	45V25	116 314	2A8	13N12
119 929	3GL332	45V26	116 315	2A10	13N13
119 930	3GL418	45V27	119 905	4GL20	N/A
119 931	3GL532	45V28	119 906	4GL40	N/A
119 917	3CG4	54N35	119 907	4GL116	N/A
119 918	3CG5	54N34	119 908	4GL332	N/A
119 919	3CG6	54N33	119 909	4GL418	N/A
119 920	3CG7	54N32	119 910	4GL532	N/A
119 921	3CG8	54N31	119 893	2AG4	53N58
119 922	3CG11	54N35	119 894	2AG5	53N59
119 923	3CG12	N/A	119 895	2AG6	53N60
119 924	3CG14	N/A	119 896	2AG7	53N61

OPTIONS AND ACCESSORIES

For TOTAL TIG™ system, select one each of the following items:

- welding power source
- TIG torch
- TIG kit (see TIG kits listed below)
- coolant system (if using water-cooled torch)
- remote control.

NOTE: The other items necessary to weld are power source primary cable, shielding gas, and filler metal.

KIT FOR 250 AMP WATER-COOLED TIG TORCH

12-1/2 ft. (3.8 m) length (#129 594)
25 ft. (7.6 m) length (#129 593)

Kit includes:

- Hose & hardware hook-up kit (THK-1)
- Consumable accessory kit (TAK-2)
- one backcap and three sizes (1/16 in., 3/32 in., 1/8 in.) of collets, collet bodies, cups, and 2% thoriated tungsten.
- Regulator/flowmeter (HRF-2425)
- Ground cable with clamp (clamp rated for 350 Amps) 12-1/2 ft. (3.8 m) or 25 ft. (7.6 m) lengths to match TIG torch length.
- Power cable adapter.

NOTE: Optional fuse block assembly is recommended for water-cooled torches.

POWER CABLE ADAPTERS

(Required on torches with one-piece, high-flex cable assembly and all water-cooled torches.)

Adapter	Stock No.
45V11	(#116 228)

INTERNATIONAL TIG TORCH CONNECTOR KIT

250/350 Amp Torch (#135 495)

For direct connection of one-piece torches or water-cooled TIG torches into power sources with International style connectors.



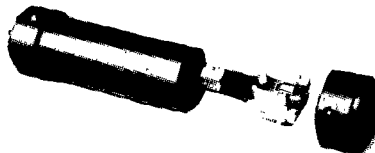
FUSE BLOCK ASSEMBLY

(For use with water-cooled torches. Five fuse links included.)

Up to 260 Amps (#116 163)

260 to 550 Amps (#116 164)

Protects torch from overheating and damage if water is not circulating or if torch is run considerably higher than its rated capacity.



CABLE EXTENSION BOX

(For use with water-cooled torches.)

CEB (non-fused) (#120 797)

CEB 260FA (#116 161)

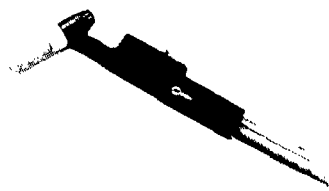
(Fused up to 260 Amps)

CEB 550FA (#116 162)

(260 to 550 Amps)

Designed to allow a water-cooled torch hose and cable assembly to be extended from the power source. Available with or without fuse protection. All components are protected by a strong, non-conductive enclosure.

Note: Hose and cables from power source to CEB box are not supplied. Use large diameter extension hoses and heavy welding cable for optimum performance.



RFTC-H14 AMPERAGE AND CONTACTOR CONTROLS

Torch handle with built-in contactor and amperage control. Includes 25 ft. (7.6 m) control cord with 14-pin plug for direct connection to all Miller solid-state TIG power sources.

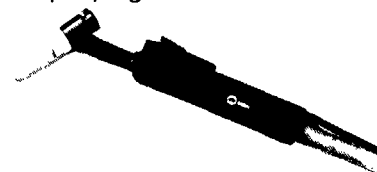
RFTC-H14-S (#129 332)

Note: Cannot be used on torches with manual gas valve. For field installation only; replaces standard torch handle.

FTC-14 REMOTE CONTACTOR AND CURRENT CONTROL

(#129 338)

Fastens to TIG torch handle. Includes 28 ft. (8.5 m) cord and 14-pin plug.



RMC-H14 AND RLC-H14 CONTACTOR SWITCHES

Torch handles with a built-in switch for remote contactor control of Miller solid-state TIG power sources. Includes 25 ft. (7.6 m) control cord with 14-pin Amphenol plug.

RMC-H14-S (Momentary) (#129 336)

RLC-H14-S (Locking) (#129 335)

Note: Cannot be used on torch with manual gas valve. For field installation only; replaces standard torch handle.

TIG HOSE HOOK-UP KITS (THK)

THK-1 (#128 065)

Provides the necessary hoses and hardware to connect water-cooled torches to a power source and water coolant system.

OPTIONS AND ACCESSORIES

GAS REGULATORS

HRF-2425 (#127 661)

The HRF-2425 regulator/flowmeter is designed for MIG, TIG, and other inert gas welding applications. It includes the 580 CGA inlet connector. The outlet pressure is preset at 25 PSIG; the maximum inlet is 3000 PSIG and has 5-40 SCFH gas delivery.

AF-150

(#127 662)

The AF-150 is a flowgauge regulator which includes the 580 CGA inlet connector for use with argon and argon/CO₂ gases. The AF-150 is adjustable for gas delivery of 8-25 SCFH with argon gas.

TIG ACCESSORY KITS (TAK)

Accessory kits include one backcap and three each of the following: collet, collet body, alumina cup, and 2% thoriated tungsten pieces.

TIG TORCH CABLE COVERS

Reinforced plastic cable covers made of tear and flame resistant material. A large and small cover is available in length to fit 12-1/2 ft. and 25 ft. (3.8 and 7.6 m) torches.

CC-12S

(#126 150)

For 12-1/2 ft. (3.8 m) torches.

CC-25S

(#126 151)

For 25 ft. (7.6 m) torches.